

[P. 74a]

411
237 The arrow, shikid, generically, had three forms among the Yaudanchi, known as t'uyosh, gibaku, and wuk'ud. The war arrow had no foreshaft, but a rather long wooden point, notched. It measured from the finger tip nearly to the opposite shoulder or a trifle more than the possible pull of the bow.... The ordinary hunting arrow had a long sharpened foreshaft, but no real head. The deer arrow had foreshaft and flint head, but the foreshaft was socketed without glue or tie, so that the main shaft would disengage after hitting.

Powers saw two types of arrows:¹⁷⁸

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[824] Of arrows, the Indians living on the plains made some for themselves of button-willow, straight twigs of the buckeye, and canes, but the most durable came from the mountains. There are two kinds, war-arrows and game-arrows; the former furnished with flint heads, the latter not. The shaft of the war-arrow consists of a single piece, but that of the game-arrow is frequently composed of three pieces, furnished with sockets so adjusted as to fit into each other snugly. When the hunter, [224] lurking behind the covert, sees the quarry approaching, he measures quickly with his eye the probable length of shot he will have to make, and if it is a long one he couches his arrow with three pieces; but if a short one, with extraordinary quickness he twitches it apart, takes out the middle section, claps the two end sections together again, and fires. An arrow made of what we should call the frailest of all woods, the tender shoot of a buckeye, and pointed with flint, has carried death to many a savage in battle. I have seen an Indian couch a game-arrow, which was pointed only with a section of arrow-wood, and drive it a full half-inch into the hardest oak!

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324 The arrow straightener used by all Yokuts has been described and illustrated by Kroeber:¹⁷⁹

The prevailing arrow straightener among the Yokuts is the Southern California form: a well-shaped rectangular block of stone, often rounded or ridged on top, and invariably with a polished transverse groove. This implement is undoubtedly associated with the employment of cane for arrows: the Yokuts are known to have used the plant, though not exclusively. The joints were warmed in the groove and bent by hand or on the ridge after the stone had been heated; the groove was also used for smoothing. The holed straightener of wood or horn for wooden shafts, as employed all over northern California, has not been reported from the Yokuts.¹⁸⁰ [171]

Cane arrows were realigned before and after each usage. The cane shaft, with foreshaft removed, was grasped at each end and drawn across the hot groove with a rolling,

¹⁷⁸p. 374.

¹⁷⁹Handbook, 530, pl. 49, c.

¹⁸⁰Letts (Uncle Jeff's Story, 26) recently reports that a perforated stone disc was so used by the Choinimni. A.N.G.

[P 80a] Wukchurni

321 Deer bone awls (poa''uk, M.L.; ap''up, M.P.)
412 were wanted by all women who made baskets and, as there was no tabu on their use for any convenient purpose, others owned them as well. About three sizes were wanted, ranging from 3 to 6 inches.¹⁹⁴ They were made by men from deer fibulae (see pl. 1, floor center).

324 An assortment of obsidian blades, also
412 made by and bought from men, was wanted for cutting meat, scraping foodstuffs and basketry materials, and cutting hide.

428 Women came by these possessions in a variety of ways. When a boy's family approached a girl's family with betrothal gifts, a burden basket was frequently included as this was an object of value and a type which a young girl could not make for herself. By the time she was betrothed, however, a girl usually had already made herself smaller twined and coiled ware of the seed-beater, winnowing tray, and sieve types. Her mother or aunts (of either side of family) would make her additional baskets, particularly the twined cooking basket.
428 Girls or women inherited from their mothers many of these household utensils; but it was said that "there weren't so many of these" (M.L.) by the time a few things had been put with the corpse and the rest were divided between daughters and claimed by the mother's sisters. Again it was impossible to formulate a rule whereby these objects were gotten or inherited. Women bought utensils and tools from each other and also from men. A woman's husband was expected to supply her with meat and skins. The latter included deerskin for the dress apron and, if the man were a poor hunter and could not procure them himself, he might even buy the deerhoofs used as a decorative fringe on the apron.

Medicines

757 The two plants used for poisoning fish
278 (yaoha and tadad) were also used medicinally. The first, for chills or headache, was mashed in a poultice; the second was boiled for use as a steam bath for chills or to soothe the vaginal tract after childbirth.¹⁹⁵ Neither plant was actively poisonous as fish stupefied by them did not need any special treatment before being eaten.

Black paint (ka'di'an) was mixed with grease as a salve. It was applied to sore

¹⁹⁴Thirteen awls collected by Dr. Barrett from Michahai, Choiniumi, and Chukchansi territory, now in the University of California, Museum of Anthropology, range in size from 3 inches (1-10839) to 7 inches (1-3997). Three unfinished awls from Drum Valley (probably Chukaimaina or Michahai) are 5 3/8, 5 1/2, and 7 3/4 inches (1-10850, 1-10838, 1-10837).

[77] ¹⁹⁵The Miwok used vinegar weed (*Trichostema lanceolatum* Benth.) as a steam treatment for "uterine trouble" (Barrett and Gifford, 174).

[P. 190 a] Chuckchansi

412 ment. -- A.H.G.] The plastic material for the
322 handle was taken from another uncooked root.

515 Soaproot was used to wash the hair, head, baskets, etc., said J.R. (Since skin clothing hardened when wet, it was not washed.) The root, when pounded, exuded a soapy juice which was then mixed with water as a washing fluid which lathered. The fibres were saved for brushes. J.R. added that, when the bulb was roasted, it was "just like roasting potatoes." [The inference is that some varieties of soaproot were pit-cooked and eaten as by other Yokuts, Miwok, Pomo, etc. -- A.H.G.]

415 Mushstirrers were made of green chaparral
322 [Ceanothus?], heated and bent into shape, tied with milkweed string at the neck of the loop and at the ends of the handle. Total length, as seen by Thrall, a bit over two feet. A pair of straight sticks some four feet long were used like tongs on hot cooking stones.

415 Cooking stones were made of soapstone,
324 said N.W.; she called these pako'yun or halix. They were heated and dropped in acorn mush to cook it. Plain stones broke when so used and "spoiled the food."

Soapstone dishes (approximately 6 in. in diameter, 2 in. deep, with walls 1 in. thick) were made by the Chuckchansi. They were used for cooking larvae and worms.¹¹⁰

412 322 Wooden mortars were known to the Chuckchansi, says Kroeber.¹¹¹

323 The absence of pottery agrees with previous findings of Kroeber and Gayton.¹¹²

411 Weapons.--Plain and sinew-backed bows were made by Chuckchansi (and Miwok). The sinew-backed bow was of cedar, about three feet long. Deer sinew from each side of the backbone, about 18 inches long, was glued on the back of the bow. The sinews had been kept dried for this purpose. Once on the bow, it was never permitted to get wet. The bowstring was always sinew. Nevertheless, the bow was kept outside the house, according to J.R., but always unstrung when not in use. This type of bow was for hunting large game -- deer, bear, cougar, coyote, wildcat -- and for warfare.

237 A plain bow of mountain willow, four feet long and strung with a milkweed string, was used for everyday shooting of squirrels, gophers, rabbits, and birds. The informant J.R. maintained that the same type of arrow was used with either bow. [Doubtless the same arrow could be used, but it is unlikely that only one arrow type was used. Moreover, the flat bird arrow is mentioned in a Chuckchansi myth. -- A.H.G.]

¹¹⁰Cf. Kroeber, Handbook, 527.

¹¹¹Ibid., 528.

¹¹²Ibid., 537; Gayton, Yokuts and Western Mono Pottery-Making.

[P. 190 b] Chuckchansi;

411 Arrows were of an unidentified wood.¹¹³ For the sinew-backed bow they were about two feet, six inches in length. Three split feathers were fastened on with wet sinew; these were slightly spiraled to make the flight straight.

The same type of bow and arrow was used for fighting as for hunting, said J.R. "You can't shoot very far with an arrow; it doesn't go straight. You have to shoot high, let it come down on the target. They can shoot farther but can't kill anything if it is very far off."

[324] The recorder saw four arrowheads at the Wyatt's place. These were called flint, but Thrall thinks they were of obsidian.

Four Chukchansi arrows in the Peabody Museum (specs. 76475) are of cane with inserted foreshafts. Their dimensions are: (1) shaft, 26-1/2 in. plus 5-in. foreshaft; (2) shaft, 29-1/2 in. plus 7-in. foreshaft; (3) shaft, 30 in. plus 7-in. foreshaft; (4) shaft, 30-1/2 in. plus 7-in. foreshaft. Sinew wrappings on forward ends where foreshafts are inserted measured: (1) 1-1/4 in., (2) 1-1/4 in., (3) 1-1/2 in., (4) 1-1/2 in. Three vanes of feathers, not spiraled, on each arrow are trimmed straight off at the butt ends. They ride free from the arrowshaft except for the binding at each end; their free lengths are: (1) 2-1/2 in., (2) 2-1/2 in., (3) 3 in., (4) 3 in. All the shafts are 3/8 in. in diameter.

MISCELLANEOUS DATA

501 Boats and weirs---There were no boats or rafts for crossing rivers. Only in play would boys sometimes get logs, roll them in the water, and ride downstream on them.

227 In Chukchansi territory Powers saw fish weirs with inserted traps into which fish were driven from upstream by means of a brush sweep similar to that of the Wobonuch (fig. 3, b); see below. They also speared fish from a booth over the water like that described by Mayfield for the Choinimni.¹¹⁴

436 Money---Several kinds of beads were shown Miss Thrall by N.W. and C.D. who said they were 321 "grave beads" and named them as follows. The descriptions are Miss Thrall's.

Supna: cylindrical white bead, 1/4-in. long, same diameter, small hole through center. Said to be cut from a larger bead about an inch long. One bead (long or short?) was worth a

[824] ¹¹³From a bush which grows beside creeks, is something like willow, but has a nearly round serrated leaf. The wood is straight and tough. It is not common, just a few bushes grow near J.R.'s place. It grows about 8 feet tall "like an elderberry."

¹¹⁴Powers, Tribes of California, 376.

[P. 191 a] chuckchansi

436 dollar:¹¹⁵ The informants were uncertain about the material, merely saying that the beads were made far off at the ocean. Later N.W. said a string of these beads, which would encircle the flat hand, was worth 50 cents. This standard measurement of beads, the circumference of the flat hand, was called kelan or k'e'an.

hakemesha: darkish red, white center, 1/4-in. long, 1/8 in. in diameter, though Emma Pumpkin said they "used to be about 3 inches long". These were said to be of "a bone naturally white inside and red outside." Thrall thought they looked like china.

lišaniu: blue, looked like glass with cut facets. Informants claimed they were "some kind of bone that lives in the ocean" and that the facets were made by being cut with obsidian.

[323] Unnamed: black inside, brownish red outside. Thrall thought these looked like baked clay. One was pinkish inside and speckled red outside, which the informant said happened when the bead was burned (fired clay or in cremation?). These beads were pointed out as especially old.

A dark green bead which came from the sea was described by J.R. He said these were strung with long white beads in between "to make it pretty and hold the beads together." He said this cylindrical bead was a certain rabbit bone, long, straight, hollow, and white (possibly the clamshell hinge; possibly a local substitute. -- A.H.G.). A length of bead money which was measured from the center of the wrist around the edge of the extended hand was worth a fixed sum. Such money, in definite units, was used to pay for baskets and for any object, services, etc. While goods were used for payments or for trade, money was the preferred tender.

436 Soapstone beads 1/2 to 3/8 in. in diameter and 1/8 in. or less long, with a 1/16-in. perforation, were "made in a belt" and traded for a basket, said M. M. had ten such beads she had found on the ground around Picayune. She did not know how they were made, but claimed they were native. (Perhaps these beads were worked into belts like those of Yokuts to the south; perhaps however, M. really meant strings of bead money. -- A.H.G.)

276 Tobacco.--Old people watched for the tobacco plants to ripen. When full grown but still green, the leaves were gathered, dried out somewhat; it remained a greenish color. The leaves were stored in a dry place, a little being taken out to smoke as wanted. "It smelled pretty near like white (man's) tobacco," said J.R. A tobacco of sweeter variety than that at Coarse Gold was said to grow farther north.

Cakes of tobacco were made from the dried leaves, pulverized and mixed with water. These little biscuits were two or three inches across,

[482] ¹¹⁵An exorbitant sum, perhaps named in the hope that Thrall was going to buy. The impression is made that none of these informants knew anything about bead money. Their statement that the obviously Spanish beads came from the ocean is entirely reasonable since that was the aboriginal source for all bead money, and Spanish beads came via the same trade route in native hands. -- A.H.G.

[P. 192 a] Chuckchausi

276 A short-lived pipe of elderwood could be quickly made by removing the pith, work of a few moments. There are no wooden pipes about today, said N.W., because a man's possessions were always burned at his death.

[64] N.W. has a pipe, which Thrall could not positively identify as of clay or of soapstone. Its weight was in favor of clay, as was its form and appearance: N.W. contended that it was soapstone, which in the past was used for pipes more than wood. N.W. found the pipe in the garden of her present home at Picayune; it lay under an apple tree; at first glance she "thought it was a big acorn."

Thrall concluded it was pottery, saying: "The pipe looks as if made of clay, by the process described in Gayton's pottery-making paper. It is brown-gray in color -- dark gray with a brownish tinge on smooth parts of the surface, slightly reddish brown on one side." Claiming that it was of soft stone like the cooking stones, N.W. said Lillian's great-grandmother, who was a Chukchausi and lived in this neighborhood, used to make stone pipes. She said the stone became hard after being fired: that it was allowed to "cook" a long time. N.W. called tobacco ba'om, the pipe Nokut.

276 Cigarettes were in common evidence by the early 1870's, at least on important occasions.¹¹⁷

262 Gum.--Green milkweed plants were pulled up and the leaves stripped off, said J.R. This caused the milky fluid to run down the stalk. The stripper held a lump of mud in his hand and, rubbing this, up and down the stalk, collected the gummy juice. When enough had been accumulated, the lump was immersed in a spring or creek, where the sticky juice clung together and the mud dissolved and washed away. The lump of gum was chewed for pleasure, like modern chewing gum.

LIFE CYCLE

Birth and Infancy

842 "Some people would have children right away after marrying and some would wait longer. Some people would wait for years," said N.W.¹¹⁸

847 One abortive, so-called, was known. A woman who did not want an offspring would drink a decoction of boiled mistletoe. It was bitter. 278 This killed the embryo, or perhaps was thought to cause sterility, for the informant claimed "nothing came out" as a result of drinking the

¹¹⁷Fowers, 389.

[834 171] ¹¹⁸If this means that some couples voluntarily denied themselves sexual relations, it is significant as being similar to a practice of the Yumans and Eastern Mono (Forde, Ethnography of the Yuma Indians, 156; Steward, Panatubiji, 187); there is no hint of unnatural sex abstinence from Yokuts to the south. -- A.N.G.

Y
W
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Not every man could make this kind of bow, but B.O. did not think that the art was confined to families. He stated that the Wobonuch made the best bows; the glue on theirs was clear, that on Waksachi bows murky.

Y
W
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For all types of shooting the bow was held in the left hand, with its left end about 30 degrees above horizontal. The left hand was so held that the joint of the third (middle) finger was slightly higher than that of the second (index) finger so that a groove or slight hollow was formed between the third finger and thumb¹⁵⁶ in which the arrow rode (fig. 10, h, Pt. I). Only one type of arrow grasp was used, that between the thumb and first bent joint of the second (index) finger (primary release); there was no hold on the string itself (fig. 10, i, Pt. I). Arrow butts were not thickened.

Four forms of arrow were distinguished: those for birds (pa-ga); for squirrels, rabbits, fox and other small game (pa-ga); for deer or vicious animals such as wildcat, cougar, and bear (u-tipa-ga); and for war (gai-wani). The first was of alderwood (napa-ap) in a single piece. When scraped down with an obsidian blade, these were straightened by being heated over coals, bent and turned in the hands and over the knee. The self-points were ground down on stone and hardened by heating. The feathering was of three split feathers from a hawk wing. The butt was nocked.

For shooting birds a simple alderwood arrow was tipped with four small crosspieces tied on perpendicularly to the shaft (fig. 10, d, Pt. I); the butt was not feathered.

W
Y
[324]
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The deer and war arrows were made of a single shaft of cane (ka'dkid, Michahai; ha'ob', Waksachi), the former long, the latter short. Both had obsidian points. To shape a cane arrow a heated stone arrow straightener was used; the cane itself was not heated. The cane, cut to the desired length, was grasped at each end and pulled back and forth across the stone groove with a rolling motion. It was sighted down its length for straightness.

W
Y
[437]

The tip end, which had been squared off, was wrapped with six turns of fine sinew cord about three inches from the end. Then the end was turned on a sharp wooden point to open up the partition in the cane, for it had been cut off just before a joint, (the boring process was called maraso gomi o'o'homa, to-make-a-hole bone-drill). Into the hole thus made was inserted the flint point (fig 10, f, Pt. I). The points for deer arrows were nearly round in cross section and had a round stem. They were obtained in rough form from the Eastern Mono of Owens Valley and dressed locally. With this type of point no force other than wedging held it in place (fig. 10, g, Pt. I); it remained in the wound. Wood points were often substituted.

¹⁵⁶The thumb is regarded as the first finger herein.

YOKUTS PLANT FOODS AND THEIR PREPARATION.

252 The buckeye process, which was probably similar to usages else-
 262 where in the State, was the following: The nuts were broken with
 a stone and soaked in water for a day. Next, the kernels were
 crushed to powder with the pestle. The last step was the extraction
 of the poison, which was done in the acorn-leaching place by the
 creek. Each time the flour dried a stick was laid aside; the pour-
 ings were so timed that the tenth stick was taken as the sun was
 nearly setting. The woman then cooked the flourlike acorn mush,
 and it was usually consumed on the spot.

The digger pine nut was not only eaten whole and raw but often
 treated like small seeds, being winnowed in a scoop-shaped basket,
 [251] pounded into flour, and cooked.
 [343]

Acorn granaries were of Miwok and Maidu type. There is no
 record of their occurrence south of the Yokuts.

Small shallow cook pots of soft stone, perhaps steatite, though de-
 [45] scribed as reddish, were used by the Chukchansi and no doubt irregu-
 [327] larly by other tribes who had access to a suitable supply of material.
 They were dug out with quartz. *Kuyati* and *kulosun* grubs, and
 angleworms, were perhaps stewed in these vessels, or more likely
 fried in their own fat at the edge of the fire.

The paddle for stirring boiling acorn mush is not a Yokuts imple-
 [45] ment, the central Miwok being the most southerly group among
 [177] whom it makes its regular appearance until southern California is
 reached. The Yokuts substitute a stick looped on itself, a less effi-
 cient stirrer but more serviceable for removing the cooking stones,
 and far more readily made. (Fig. 38.)

THE MORTAR.

412 The mortar was a pit in an outcrop of granite, used until the depth
 of the hole became inconvenient. A convenient exposure of bedrock
 near a village often contains dozens of holes in all stages of wear
 within a few yards. (Pl. 45.) Poles leaned together with brush
 thrown on made an arbor under which a group of women would work
 for hours, gossiping or singing. Their pestles were often left on the
 spot; they are rude, irregular, with little taper, and somewhat oval
 in cross section, even with one or two sides flat or concave; in fact,
 little more than longish river boulders, somewhat shaped, partly by
 pecking with the edge of a flat cobble, and in part by continued
 usage.

On the alluvial plains portable mortars were necessary. The most
 common form of these among the Tachi was one of white oak. The
 flat-bottomed wooden block was little more than a foot high, half

into the desert territory where they were scarce, trade them for obsidian, which was plentiful there, return it to his own land and sell it for Yokuts shell or steatite beads, which passed for money. It will be seen from this and from what is to follow that Yokuts money represented principally the accumulation of labor. 436

The cheapest Yokuts money was made from periwinkle or olivella shells with the tips ground off, so they could be strung. The smaller shells were of less value than the larger. The *Wukchumne* Yokuts called these shells *Chawik*. Olivella shells were made into three forms of beads besides the one described. They were split in half. The large, outer half was punched for a string. Some of these beads were five-eighths of an inch across and more than an inch long. In some Yokuts cemeteries these two crude forms of Yokuts money have been found in great quantities; in some instances there have been several gallons in one grave, the hoarded savings of the first penny-pinchers and nickel-grabbers of the San Joaquin Valley. 454

The whorl of the periwinkle was made into a thick bead having a curved edge. When strung, these nested somewhat like the snake-like gold chains made by modern jewelers. One of these beads was worth six of the shells with tips ground off, or two of the large half-shell beads. They were called *Huchin*.

From the thin lip of the periwinkle shell was made a bead which sometimes strung as many as twenty to the inch. "Two of these," said *Wahumchah*, an aged *Yowlumne* Yokuts, "were worth one curved bead. We called them *Mochowkuh* (Mochow'-kuh)." Beads made from purple mussel shell were called *Sueyuk* (Suey'-ook). From the keyhole limpet shell a hair ornament was made. *Wahumchah* stated that they were not common and that he did not know the value they had in relation to the other old Yokuts money. 301

From fine-grained steatite the Yokuts made a valuable form of bead-money. This steatite was mined by the *Yokodo* Yokuts near Lindsay Peak, east of the present town of Lindsay. It was traded or sold by them to Yokuts traders from tribes over the entire southern San Joaquin Valley. Steatite bead money was very valuable. *Wahumchah* stated that it was three times as valuable as the most valuable olivella beads. Near Woodville I once found a place where a steatite bead maker had manufactured and cached his product for many years. From the sandy soil I screened thousands of completed beads, as well 436 324 438

436 as more thousands in all stages of completion. A study of these
 324 proved that the steatite was first split into thin slabs, gouged,
 scraped, and sanded smooth, then cut into strips by means of a
 chipped stone saw. I found two of these saws, their chipped
 412 edges still coated with steatite. The strips were next cut into
 squares. Cuts were made from opposite sides until the strip
 was severed. Then holes were drilled in the square blanks.

Ichow, last chief of the Wukchumne, explained to me the whole process of making steatite beads, not knowing at the time that I had already found proof of almost every statement he was making. Said *Ichow*, "When I was a boy I saw an old Wukchumne man make lots beads. He drive stake in ground. He sit on ground straddle that stake. He cut little square hole in top that stake. He put square bead in that hole. Then he take little stick with *kots* (obsidian) drill point on end. He spin that drill between his hands and make holes in them square beads."

Ichow went on to explain that the square beads were strung on a small, hardened rod of chamise wood and rolled between the hand and a gritty, flat piece of sandstone. This ground the corners from the square beads and left them of uniform size. This steatite bead was the most common form of Wukchumne money. Said *Ichow*, "Most our money was them soapstone beads. Them *Telumne*, *Kaweak*, *Koyeti*, and *Choinok* used the same beads almost all time. Them *Chumut*, *Tachi*, and *Wowol* people used more shell money, but they used some our soapstone money, too."

The most interesting feature of this steatite Yokuts money is that the edges of it were milled, almost exactly as are the edges of our silver dollar. The principal difference in the milling was that the Yokuts bead-money was milled at an angle with the flat sides. This milling is surprisingly uniform and will be found on this form of Yokuts money at old village sites from Paleta and Tejon Canyon on the south, to Coalinga and Friant on the north.

436 Spangles and ornaments of various forms and sizes were
 301 made from abalone shell. I have several statements establishing the fact that they passed from person to person as money; but because of their supernatural power, they were valued so highly that such use was greatly restricted. They were known as *Tahp* and were used on *Tripne* (supernatural) ceremonial costumes. They were also placed over the eyes, ears, and/or

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763
888

415
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It was probably because the Yokuts had access to several deposits of steatite that they did not develop the art of pottery making. The above steatite cooking vessels were placed directly in the fire. Top center and lower left are frying pans. Top left and right are large closed pots, holding about three gallons and used for boiling and stewing. The two lower right are shallow, open cooking vessels. Aged Yokuts have stated that meat, greens, acorns, mushrooms and other fungi were cooked in such vessels.

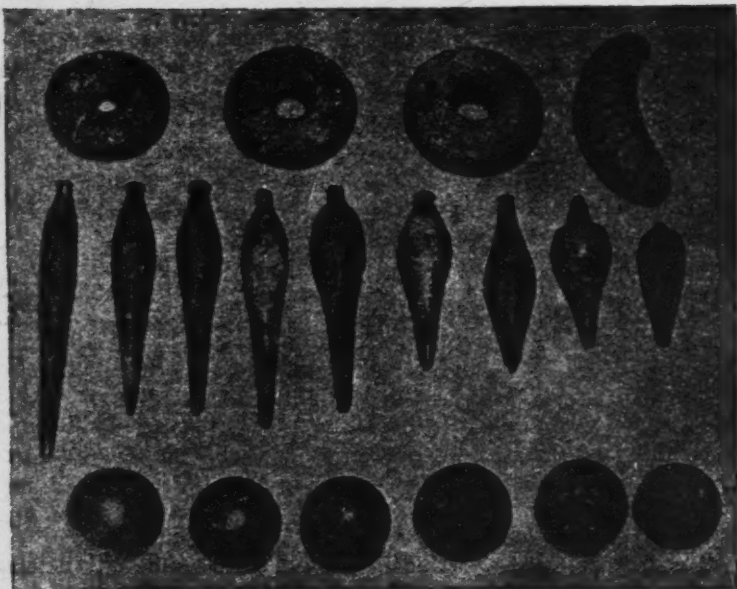
had been taken sick in a white man's house and the family knew they could not burn it.

361 In many places where cultivation has not destroyed them, the remains of these houses are even yet to be found along the banks of streams and lakes throughout the entire San Joaquin Valley. At one village site near what was once the northwestern shore of Tulare Lake and described in a former chapter, the writer just a few days before this manuscript went to press counted the ruins of more than twenty of these houses.

221 During the acorn and other seed seasons, with the exception
342 of a few old persons, the Indians were likely to leave the permanent village and live for a month or more at temporary camp sites near the ripening seeds. Consequently, during the major portion of the time, when the most of the Indian population was

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[172
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Top left are three perforated stones used in ceremonials and as game stones. At right is a crescent shaped stone, reported as having been used in a girls' adolescence ceremony. Center are charm stones. The one at the extreme right was found near Mountain View, Santa Clara County. The eight stones at the left were found in a "nest" at the Harris mound, six miles west of Tulare. Bottom row shows six stone footballs, found buried together under an oak tree on Kings River Island near Laton.

diameter and had a hole in the center about an inch in diameter.

"This game was played principally by the young men. It was a much quieter game than the disc game, but was scored in the same way. They shot wooden pointed arrows at the stone as it passed by.

[412]

"This same stone was used to straighten their arrows and their shafts for gigging fish."

MISCELLANEOUS GAMES

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In addition to the statement made by Mayfield concerning the Indian game courts, we are assured by other pioneers who lived near the Indians during the early settlement of the San Joaquin Valley, as well as by old Indians themselves, that

CHAPTER VIII

HUNTING AND FISHING

THE MANUFACTURE OF CHIPPED POINTS

There are many traditions about the North American Indians which persist with surprising uniformity and which are also quite characteristic of that noble race. There are on the other hand certain traditions which are even more persistent and which are certainly not generally true, and some possibly with no foundation in fact. Probably the most dogged of these last traditions concerns the manufacture of arrow and other chipped points. The most common tradition concerning this type of work holds that the chip was removed by heating the stone and then applying water, or some other cooling agent. 324 •

Some stories state that the stone was heated in the coals, and the water applied with a small wooden stick, or brush. Other accounts state that the moisture was applied from the mouth by means of a milkweed string which was allowed to come in contact with the heated stone. Other variations of this account are too numerous to mention, but they all depend upon the supposed reaction of heating and sudden cooling. It is probable that such a chipped point has never been manufactured since the beginning of time, but no amount of reasoning or scientific research or definite statements by Indians seems to be sufficient to put an end to such stories.

The most common method of chipped point manufacture depended upon the breaking from a large piece of stone of a suitable flake. This flake was thrown off from the stone by means of a heavy blow. The hammer generally used was a heavy piece of bone, often the shin bone of a deer or elk, the blow being struck with the end of the bone. [412]

By some manufacturers the large fragment of stone was held against a lump of stiff clay and the flake thrown off between the clay and the stone. It is explained that this kept the blow from fracturing the flake itself. If the flake was quite large and a large spear point or knife was to be made from it, it was placed against the same lump of clay and further reduced by blows. These chips were removed with the bone hammer in

- 324 the same way that the first flake was obtained. In this manner the flake was roughly reduced to shape.

[412] The remainder of the chipping was done by pressure and not by blows. The method by which this was done probably varied, but the principle was always the same. It is stated by one authority that the Indian squatted with his knees on either side of an up-right stake which had been driven securely into the ground. The work was rested on the top of this stake. The implement used in pressing off the small flake was generally the tip of a buck horn.

The selection of materials like bone and horn for the work of chipping brittle stones, or obsidian, which is really a volcanic glass, shows thorough understanding of the nature of the material. The horn or bone is hard enough not to be broken in removing the chips, but at the same time is yielding enough that the edges of the chips cut into it and are not shattered, as would be the case with a steel or stone implement.

The flake which was being reduced by shaping was held in the left hand between the tips of the fingers and the base of the thumb with the edge toward the worker, the hand being protected by a piece of buckskin. The buck horn was held in the right hand. It was sometimes lashed to a stick, which extended up as far as the elbow and was held between the upper and lower arms, with the elbow bent almost double.

The side of the flake was placed upon the edge of the top of the stake, which extended several inches above the knees of the worker. The buck horn was placed across the opposite edge of the stake with the tip resting upon the edge of the flake where the chip was to be removed. The point where these two met was elevated approximately one half inch above the top of the stake.

By bearing down strongly on both buck horn and flake so that they could not slip on the stake and then raising their outer ends gradually, the worker could secure tremendous leverage, and bring great pressure to bear upon the edge of the flake. As the flake cut into the buck horn, and as both were lowered toward the top of the stake, the pressure became so great that a chip was thrown off the flake. By varying the direction of the pressure exerted against the flake, the direction of the fracture could be controlled. The fracture was almost directly in the line of pressure.

The writer has seen arrow and spear points made in this manner. In less than four minutes of measured time a flake was removed from a large piece of obsidian and reduced to a finely worked point. During this time complete explanation was made of the entire process. 324 ●

I know that this method will be questioned by many laymen, but not by persons who have investigated these methods of manufacture. A popular bit of misinformation will always survive. I have a very distinct recollection of searching through a vineyard for arrow points and Indians beads and of collecting a mixed handful of them only to be told by one of the natives (white) that they were not beads or arrow points, but were pumped from the irrigation well and that they could be found in all parts of the field.

THE ANTELOPE SURROUND

One of the most interesting methods of taking game, common to the Yokuts Indians, is that of the "surround" or "drive". In some cases, as in taking jack rabbits, a net and Indian fence were used. 224

Probably the largest game taken by driving was antelope. Before the coming of the Americans the San Joaquin Valley was covered with vast herds of these animals. If the descriptions of early travelers and settlers are to be credited, there were probably hundreds of thousands of these animals within a distance of twenty or thirty miles. They ran in herds and covered the surrounding country like a moving tan blanket. 136 224

The pronghorned antelope of the San Joaquin Valley is undoubtedly extinct. In the northern portion of California there is a wild game preserve upon which have been placed what are said to be some Great Plains antelope. They are also said to be the same as were those of the San Joaquin Valley.

The horns of the antelope were not shed like the antlers of the deer. Both male and female carried horns. These horns were about ten to twelve inches in height and stood almost erect. The tops curved sharply together in the shape of large question marks. Near the base of each horn was a small webbed point, or eye guard. The base of the horn was rough, but the tip was smooth, like the horn of a cow.

Antelope were probably possessed of more curiosity than any animal with which we are familiar, unless it is the more or less domesticated mule. It was this curiosity which made the

411 diameter. When not used the bow was unstrung, and the string tied around the left limb of the bow, and to prevent the slightest lesion of either the bow or the string the former had a section of fur from some animal's tail, about four inches long, slipped on to it.

Of arrows, the Indians living on the plains made some for themselves out of button-willow, straight twigs of the buckeye, and canes, but the most durable came from the mountains. There are two kinds, war-arrows and game-arrows; the former furnished with flint-heads, the latter not. The shaft of the war-arrow consists of a single piece, but that of the game-arrow is frequently composed of three pieces, furnished with sockets so adjusted as to fit into each other snugly. When the hunter, lurking behind the covert, sees the quarry approaching, he measures quickly with his eye the [224] probable length of the shot he will have to make, and if it is a long one he couches his arrow with three pieces; but if a short one, with extraordinary quickness he twitches it apart, takes out the middle section, claps the two end sections together again, and fires. An arrow made of what we should pronounce the frailest of all woods, the tender shoot of a buckeye, and pointed with flint, has carried death to many a savage in battle. I have seen an Indian couch a game-arrow, which was pointed only with a section of arrow-wood, and drive it a full half-inch into the hardest oak! An old hunter says he has seen an Indian stand a hundred paces distant from a hare, slowly raise his long, polished bow, shoot a quick glance along the arrow, then send it whizzing through both his enormous ears, pinning him fast to a tree behind him.

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411 Some mention was made in Chapter XI of the manner in which flint arrow-heads are made. Mr. E. G. Waite, in a communication to the *Overland Monthly*, gives the following description of the method employed both in Central California and among the Klamaths, as he witnessed it in an early day:

"The rock of flint or obsidian, esteemed by the natives for arrow-pointing, is broken into flat pieces, after the manner usually described. When the pieces have reached a proper size for arrow-heads the mode of finishing it is in this wise: The palm of the left hand is covered with buckskin held in its place by the thumb being thrust through a hole in it. The

SOME MANUFACTURES.

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- 324 inchoate arrow-head is laid on this pad along the thick of the thumb, the
411 points of the fingers pressing it firmly down. The instrument used to
[237] shape the stone is the end of a deer's antler, from four to six inches in
length, held in the right hand. The small round point of this is judiciously
pressed upon the edge of the stone, cleaving it away underward in small
scales. The buckskin, of course, is to prevent the flesh from being
wounded by the sharp scales. The arrow-head is frequently turned around
and over to cleave away as much from one side as the other, and to give it
the desired size and shape. It is a work of no little care and skill to make
even so rude an instrument as an arrow-head seems to be, only the most
[887] expert being very successful at the business. Old men are usually seen at
this employment."

Mr. B. P. Avery, in an article entitled "Chips from an Indian Workshop", published in the same magazine, gives a very pleasant account of a visit made by him, near the summit of the Sierra, to what had evidently been the spots selected by the aborigines for the manufacture of these arrow-heads. They were generally so chosen as to show that the Indians had an eye for the picturesque and the romantic, on bold, overlooking promontories, commanding prospects far and wide down the mountain slope and over the plains; and the brilliant-colored chips of obsidian, jasper, chert, cornelian, and other flints, lying in piles, completed a very pleasing picture.

- 291 Most California Indians go now, and always have gone, barefoot; but
some few were industrious enough to make for themselves moccasins of a
very rude sort, more properly sandals. Their method of tanning was by
281 means of brain-water. They dried the brains of deer and other animals,
reduced it to powder, put the powder into water, and soaked the skins
[237] therein—a process which answered tolerably well. The graining was done
291 with flints. Elk-hide, being very thick, make the best sandals.

- 436 The usual shell-money is used among them, and a string of it reaching
from the point of the middle finger to the elbow is valued at 25 cents.
A section of bone, very white and polished, about two and a half
inches long, is sometimes strung on the string, and rates at 12½ cents.
They uniformly undervalue articles bought from the Americans; for